

Patent claims

1. Method to generate a print image on a carrier material (40),  
  
5 in that a hydrophilic layer (52) with a molecular layer thickness is generated on the surface of a print carrier (10) usable for printing,  
  
in a structuring process, hydrophilic regions (68) and hydrophobic regions (64) are generated corresponding to the structure of the print image to be  
10 printed,  
  
on the surface of the print carrier (10), a fountain solution layer (54) is applied, whereby a fountain solution layer (54) forms only on the hydrophilic regions (68), such that ink-attracting regions and ink-repelling  
15 regions are created corresponding to the effected structuring,  
  
ink that adheres to the ink-attracting regions (64) and that is not absorbed by the ink-repelling (68) regions is applied on the surface,  
  
20 the applied ink is transferred onto the carrier material (40) in the further course,  
  
and in that, before a new structuring process the surface of the print carrier (10) is cleaned and a hydrophilic layer (52) is regenerated.  
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2. Method according to claim 1, in that the hydrophilic layer (52) on the surface of the print carrier has a thickness of less than 100 nm, preferably less than 10 nm.  
  
30 3. Method according to claim 1 or 2, in that the hydrophilic layer ensues via activation of the surface.

4. Method according to claim 3, in that chemical activators and/or reactive gases are used and/or an energy supply ensues for activation.
- 5 5. Method according to any of the preceding claims, in that the surface of the print carrier (10) has an  $\text{SiO}_2$  layer comprising  $\text{SiOH}$  molecules that is fashioned via the effect of hot water, hot water vapor and/or via alkaline solutions, preferably  $\text{NaOH}$ .
- 10 6. Method according to any of the preceding claims, in that the hydrophilic layer is generated by firing the surface of the print carrier (10).
7. Method according to any of the preceding claims, in that a hydrophilic substance (52) is applied on the surface of the print carrier (10) to generate  
15 the hydrophilic layer.
8. Method according to claim 7, in that surfactants or alcohols are used as a hydrophilic substance.
- 20 9. Method according to claim 7 or 8, in that the hydrophilic substance is applied in a layer thickness smaller than 100 nm, preferably smaller than 10 nm.
10. Method according to any of the claims 7 through 9, in that the application  
25 of the hydrophilic substance ensues via rolling, scraping, spraying.
11. Method according to any of the preceding claims, in that the cleaning and the generation of the hydrophilic layer ensues in a single process step.
- 30 12. Method according to claim 11, in that hot water and/or water vapor is used for cleaning.

13. Method according to any of the preceding claims, in that radiation is used for structuring.
- 5 14. Method according to claim 13, in that the radiation of a laser system, a laser, laser diodes, LEDs or a laser diode array is used.
15. Method according to any of the preceding claims, in that an ink separation ensues before the transfer of the ink onto the carrier material (40).
- 10 16. Method according to any of the preceding claims, in that the surface of the print carrier (10) is a generated cylinder surface or a continuous band.
17. Device to generate a print image on a carrier material (40),
- 15 in which means are provided via which
- a hydrophilic layer (52) with a molecular layer thickness is generated on the surface of a print carrier (10) usable for printing,
- 20 in a structuring process, hydrophilic regions (68) and hydrophobic regions (64) are generated corresponding to the structure of the print image to be printed,
- 25 on the surface of the print carrier (10), a fountain solution layer (54) is applied, whereby a fountain solution layer (54) forms only on the hydrophilic regions (68), such that ink-attracting regions and ink-repelling regions are created corresponding to the effected structuring,
- 30 ink that adheres to the ink-attracting regions (64) and that is not absorbed by the ink-repelling (68) regions is applied on the surface,

the applied ink is transferred onto the carrier material (40) in the further course,

5 and via which, before a new structuring process the surface of the print carrier (10) is cleaned and a hydrophilic layer (52) is regenerated.

18. Device according to claim 17, in which the hydrophilic layer (52) on the surface of the print carrier has a thickness of less than 100 nm, preferably  
10 less than 10 nm.

19. Device according to claim 17 or 18, in which the hydrophilic layer ensues via activation of the surface.

15 20. Device according to claim 19, in which chemical activators and/or reactive gases are used and/or an energy supply ensues for activation.

21. Device according to any of the preceding claims, in which the surface of the print carrier (10) has an  $\text{SiO}_2$  layer comprising  $\text{SiOH}$  molecules that is  
20 fashioned via the effect of hot water, hot water vapor and/or via alkaline solutions, preferably  $\text{NaOH}$ .

22. Device according to any of the preceding claims, in which the hydrophilic layer is generated by firing the surface of the print carrier (10).  
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23. Device according to any of the preceding claims, in which a hydrophilic substance (52) is applied on the surface of the print carrier (10) to generate the hydrophilic layer.

30 24. Device according to claim 23, in which surfactants or alcohols are used as a hydrophilic substance.

25. Device according to claim 23 or 24, in which the hydrophilic substance is applied in a layer thickness smaller than 100 nm, preferably smaller than 10 nm.
- 5 26. Device according to any of the preceding claims, in which the cleaning and the generation of the hydrophilic layer ensues in a single process step.
- 10 27. Device according to any of the preceding claims, in which radiation is used for structuring.
28. Device according to claim 27, in which the radiation of a laser system, a laser, laser diodes, LEDs or a laser diode array is used.
- 15 29. Device according to any of the preceding claims, in which an ink separation ensues before the transfer of the ink onto the carrier material (40).
30. Device according to any of the preceding claims, in which the surface of the print carrier (10) is a generated cylinder surface or a continuous band.